National Institute of Environmental Health Sciences

Australian firefighters' exposure to air toxics during bushfire burns of autumn 2005 and 2006

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Abstract:

Bushfire fighting is a hazardous occupation and control strategies are generally in place to minimize the hazards. However, little is known regarding firefighters' exposure to bushfire smoke, which is a complex mixture of toxic gases and particles. In Australia, during the prescribed burning season, firefighters are likely to be exposed on a regular basis to bushfire smoke, but whether these exposures affect health has yet to be determined. There are a number of factors that govern whether exposure to smoke will result in short-term and/or long-term health problems, including the concentrations of air pollutants within the breathing zone of the firefighter, the exposure duration, and health susceptibility of the individual, especially for pre-existing lung or heart disease. This paper presents measurements of firefighters' personal exposure to bushfire smoke, the first step within a risk management framework. It provides crucial information on the magnitude, extent and frequency of personal exposure to bushfire smoke for a range of typical scenarios. It is found that the primary air toxics of concern are carbon monoxide (CO), respirable particles and formaldehyde. Also, work activity is a major factor influencing exposure with exposure standards (both average and short-term limits) likely to be exceeded for activities such as suppression of spot fires, holding the fireline, and patrolling at the edge of a burn area in the urban-rural interface.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Extreme Weather Event

Air Pollution: Particulate Matter, Other Air Pollution

Air Pollution (other): CO, VOCs

Extreme Weather Event: Wildfires

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Australasia

Health Impact:

specification of health effect or disease related to climate change exposure

Neurological Effect, Respiratory Effect

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Workers

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified